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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/713,197

11/17/2003

Ji-Young Moon

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EXAMINER

GERGISO, TECHANE

ART UNIT

PAPER NUMBER

2437

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Supplemental  
Notice of Allowability**

Application No.

10/713,197

Examiner

TECHANE J. GERGISO

Applicant(s)

MOON, JI-YOUNG

Art Unit

2437

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to April 03, 2009.
2. ☒ The allowed claim(s) is/are 1-8 and 11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date ____     | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|  | 9. <input type="checkbox"/> Other ____.   |

Art Unit: 2437

### **DETAILED ACTION**

1. This is a supplemental notice of allowance in response to the applicant's telephone call on May 19, 2009 requesting update for claim 8 to be listed in the allowed claims with regard to the Notice of Allowance Mailed on April 16, 2009.

### **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

3. Authorization for this examiner's amendment was given in a telephone call with S. Stuart Lee Reg. No.: 61, 124 on April 10, 2009; and the claims has been amended as follows:

#### **LISTING OF CLAIMS:**

1. (Currently amended): A moving image watermarking method using a human visual system, comprising the steps of:

a) obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image;

b) separately performing a plurality of masking operations, wherein the plurality of the masking operations are separately performed on identical moving image data;

Art Unit: 2437

c) obtaining a global masking value through the separately performed masking operations;

d) obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable, to an original frame value; and

e) inserting a watermark into a moving image frame using the watermarked frame value;

~~wherein the step b) comprises the step of performing a motion masking operation.~~

2. (previously presented): The watermarking method according to claim 1, wherein the step b) further comprises the step of performing a spatial masking operation.

3. (previously presented): The watermarking method according to claim 2, wherein the performing the spatial masking operation comprises the steps of:

adjusting contrast of the moving image frame; and

extracting edges from the contrast-adjusted frame.

4. (Currently amended): The watermarking method according to claim 2, wherein ~~the~~ performing ~~the~~ a motion masking operation comprises the steps of:

obtaining a luminance difference between a current frame and a previous frame; and  
extracting edges from the current frame.

Art Unit: 2437

5. (original): The watermarking method according to claim 2, wherein the step b) further comprises the step of performing a frequency masking operation.

6. (previously presented): A moving image watermarking method using a human visual system, comprising the steps of:

a) obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image;

b) separately performing a plurality of masking operations;

c) obtaining a global masking value through the separately performed masking operations;

d) obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable, to an original frame value;

e) inserting a watermark into a moving image frame using the watermarked frame value;

f) comparing an image quality of the watermarked frame with an image quality set to a target; and

g) decreasing the control variable by a predetermined value if the image quality of the watermarked frame is less than the target image quality, and increasing the control variable by a predetermined value if the image quality of the watermarked frame is greater than the target image quality.

Art Unit: 2437

7. (original): The watermarking method according to claim 6, wherein the image quality is estimated on the basis of Peak-Signal-to-Noise Ratio (PSNR).

8. (previously presented): The watermarking method according to claim 1, further comprising the step of f) extracting the watermark, the step f) comprising the steps of:

subtracting the watermarked frame value from the original frame value to obtain a subtracted result value; and exclusive-ORing the subtracted result value and a random variable obtained by a key value, and obtaining an exclusive-ORed result.

9-10. (canceled).

11. (Currently amended): A recording medium for storing computer programs for executing a moving image watermarking method using a human visual system, the moving image watermarking method comprising:

a) obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image;

b) separately performing a plurality of masking operations, wherein the plurality of the masking operations are separately performed on identical moving image data;

c) obtaining a global masking value through the separately performed masking operations;

d) obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable, to an original frame value; and

Art Unit: 2437

e) inserting a watermark into a moving image frame using the watermarked frame value;

~~wherein the step b) comprises the step of performing a motion masking operation.~~

12.-15. (canceled).

### **Reason for allowance**

4. After consideration of the applicant's communication filed on April 03, 2009 in the After Final in response to the Final Office Action mailed on February 03, 2009, and through examination of claims 1-8 and 11; and further search, the claims have been found in condition for allowance over prior arts of record.

5. The following is an examiner's statement of reasons for allowance:

Claims 1, 6 and 11 include the following features which are not taught or further suggested and would not have been obvious over prior arts of record and these claimed features are: obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image; separately performing a plurality of motion masking operations on identical moving image data; obtaining a global masking value through the separately performed motion masking operations; obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable to an original frame value; and inserting a watermark into a moving image frame using the watermarked frame.

Art Unit: 2437

In light of the specification (see paragraphs 08 and 11), the step of “separately performing a plurality of masking operations” comprises the steps of performing a spatial masking operation, and performing a motion masking operation, and may further comprise the step of performing a frequency masking operation.

The **spatial masking operation**: adjusting contrast of the moving image frame; and extracting edges from the contrast-adjusted frame (See applicant disclosure paragraph 0009).

The **motion masking operation**: obtaining a luminance difference between a current frame and a previous frame; and extracting edges from the current frame (See applicant disclosure paragraph 0010).

The **frequency masking operation**: is obtained on a DCT-based visual model of Watson by dividing an image into 8\*8 blocks and calculating a frequency masking value using a frequency sensitivity table which is an experimentally measured quantity to represent a minimum DCT coefficient detected within a corresponding block when masking noise is not applied to the block with respect to each of blocks (See applicant disclosure paragraph 0032).

Prior art of record neither teaches nor suggests the above claim limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”



Art Unit: 2437

### **Contact Information**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TECHANE J. GERGISO whose telephone number is (571)272-3784 and fax number is ~~(571) 273-3784~~. The examiner can normally be reached on 9:00am - 6:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Techane J. Gergiso/

Examiner, Art Unit 2437

/Emmanuel L. Moise/

Supervisory Patent Examiner, Art Unit 2437